

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today
(1) was not written for publication in a law journal and
(2) is not binding precedent of the Board.

Paper No. 13

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte PAUL D. RIES,
MICHAEL M. OLKEN, MALCOLM W. WARREN II,
and ROBERT C. DYE

Appeal No. 1996-3659
Application 08/237,484¹

ON BRIEF

Before GARRIS, WARREN, and LIEBERMAN, Administrative Patent Judges.

LIEBERMAN, Administrative Patent Judge.

DECISION ON APPEAL

¹ Application for patent filed May 3, 1994.

Appeal No. 1996-3659
Application No. 08/237,484

This is an appeal under 35 U.S.C. § 134 from the examiner's refusal to allow claims 1 through 18 which are all of the claims in the application.

THE INVENTION

The invention is directed to a vapor deposition method for coating a substrate with a porous zeolite film. The method includes irradiating a porous zeolite target with a pulsed laser beam to vaporize the zeolite in a three-dimensional plume and intercept the plume on a substrate to form a porous zeolitic film.

A separate embodiment is drawn to a sensor comprising a piezoelectric substrate having a porous zeolitic film coated thereon, formed by irradiating a porous zeolite with a pulsed laser beam to vaporize the zeolite into a three-dimensional plume. The plume is thereafter intercepted on the substrate to form the porous zeolite film.

THE CLAIMS

Claims 1 and 10 are illustrative of appellants' invention and are reproduced below.²

² Claim 10 inappropriately contains an "A" after the conclusion of the claim in the Appendix of the Brief. Claim 10 in the body of the record does not contain, "A". Hence its

Appeal No. 1996-3659
Application No. 08/237,484

1. A vapor deposition method for coating a substrate with a porous zeolitic film, the method comprising the steps of:

(a) irradiating a porous zeolite with a pulsed laser beam of at least sufficient duration and intensity to vaporize the zeolite in a three-dimensional plume adjacent to the zeolite; and

(b) intercepting the plume on the substrate to form the porous zeolitic film.

10. A sensor, comprising:

(a) a piezoelectric substrate; and

(b) a porous zeolitic film coated on the piezoelectric substrate, the porous zeolitic film formed by irradiating a porous zeolite with a pulsed laser beam of at least sufficient duration and intensity to vaporize the zeolite in a three-dimensional plume adjacent to the zeolite and then intercepting the plume on the substrate to form the porous zeolitic film.

THE REFERENCES OF RECORD

As evidence of obviousness, the examiner relies upon the following references:

Venkatesan et al. (Venkatesan)	5,015,492	May 14, 1991
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Bein et al. (Bein)	5,151,110	Sep. 29, 1992
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Bals et al. (Bals)	5,331,845	Jul. 26, 1994 (filed Jan. 19, 1993)
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Böszörményi et al. (Boszormenyi), "Model silica-alumina acid catalysts for surface science and catalysis studies prepared

inclusion in the Appendix is considered inadvertent.

Appeal No. 1996-3659
Application No. 08/237,484

by argon ion beam sputter deposition using HY-zeolite targets," Catalysis Letters, vol. 10, pp. 343-355, 1991.

THE REJECTIONS

Claim 10 stands rejected under 35 U.S.C. § 102(e) as being anticipated by Bals.

Claims 1 through 9 stand rejected under 35 U.S.C. § 103 as being unpatentable over Venkatesan in view of Bein.

Claims 1 through 9 stand rejected under 35 U.S.C. § 103 as being unpatentable over Boszormenyi in view of Venkatesan.

Claims 10 through 18 stand rejected under 35 U.S.C. § 103 as being unpatentable over Boszormenyi in view of Venkatesan.

OPINION

We have carefully considered the respective arguments for and against patentability by appellants and the examiner. We sustain the rejection under 35 U.S.C. § 102(e) as to claim 10, and reverse each of the rejections under 35 U.S.C. § 103 as to claims 1 through 18.

The Section 103 Rejections over Boszormenyi in view of Venkatesan

"[T]he examiner bears the initial burden, on review of the prior art or on any other ground, of presenting a *prima*

facie case of unpatentability." See In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). The examiner relies upon a combination of two references to reject the claimed subject matter and establish a *prima facie* case of obviousness. The basic premise of the rejection is that the primary reference to Boszormenyi discloses a method, "of forming a **porous** zeolitic film on a substrate."³ See Answer, page 4. The premise is based on the examiner's finding that zeolites are by definition porous. Accordingly, any replication of the stoichiometry would result in a film which would likewise be porous. See Answer, page 6. We disagree. Zeolites have pores which are determined by the unit structure of the crystal. However, on the record before us, we find no evidence that the resulting films deposited by Boszormenyi are necessarily crystalline porous zeolite films. Indeed, Boszormenyi repeatedly states that he prepares thin films of silica-alumina and we so find. See Abstract, pages 344, 352 and Figure 1. Moreover, at pages 354 and 355, Boszormenyi refers to the preparation of amorphous thin films. Based upon

³ Emphasis ours.

Appeal No. 1996-3659
Application No. 08/237,484

the above considerations, we conclude that the thin films deposited on the substrate are not a porous zeolitic film as required by the claimed subject matter.

Furthermore, our analysis and conclusions extend to claims 10 through 18. It has not been shown that the combination of references result in a sensor having a piezoelectric substrate with the requisite porous zeolitic film coated thereon. Based upon the above analysis, we have determined that the examiner's legal conclusion of obviousness is not supported by the facts. "Where the legal conclusion is not supported by the facts it cannot stand." In re Warner, 379 F.2d 1011, 1017, 154 USPQ 173, 178 (CCPA 1967).

The Section 103 Rejection over Venkatesan in view of Bein

In viewing the references as a whole, the examiner has not adequately explained why it would have been obvious to one of ordinary skill in the art to have combined the method of Venkatesan with the sensor of Bein. Venkatesan prepares a thin film using vapor deposition techniques. A pellet of a complex material, wholly unrelated to a zeolite, is irradiated and deposited in the form of a thin film on a substrate. In contrast, Bein prepares a molecular sieve sensor of chemically

Appeal No. 1996-3659
Application No. 08/237,484

coated zeolites. The examiner's hypothesis that the use of zeolite would have been obvious in the process of Venkatesan is unsupported by facts. There is no evidentiary basis for choosing a zeolite as opposed to other complex materials which are specifically disclosed. Furthermore, the additional requirement of a pulsed laser beam required by the claimed subject matter is neither disclosed nor suggested in Venkatesan.

The examiner must show reasons that the skilled artisan confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for a combination in the manner claimed. We determine that there is no reason, suggestion, or motivation to combine the references in the manner proposed by the examiner. Accordingly, the examiner has not established a *prima facie* case of obviousness. See In re Rouffet, 149 F.3d 1350, 1357-1358, 47 USPQ2d 1453, 1458 (Fed. Cir. 1998).

The Section 102(e) Rejection over Bals

Bals discloses a piezoelectric substrate having a coating of zeolite deposited thereon by plasma deposition,

Appeal No. 1996-3659
Application No. 08/237,484

sputtering or chemical vapor deposition among a limited number of coating processes disclosed. See column 4, lines 36-54. We find that Bals specifically discloses that molecular sieves such as zeolites are deposited on the piezoelectric substrate. The resulting zeolite coating clearly is porous (e.g. see lines 16-19 in column 2 of Bals), and the appellants do not specifically argue otherwise.

As to appellants' arguments that Bals does not disclose pulsed laser deposition for making porous films from zeolite targets (see page 10 of the Brief), claim 10 is a product-by-process claim wherein the determination of patentability is based on the product itself. See In re Thorpe, 777 F.2d 695, 697, 227 USPQ 964, 966 (Fed. Cir. 1985). Accordingly, the arguments raised by appellants noted above are not relevant to the consideration of patentability of this claim.

Based upon the above considerations, we conclude that Bals teaches each of the limitations required by the claimed subject matter. Accordingly, we affirm the rejection of claim 10 over Bals.

DECISION

Appeal No. 1996-3659
Application No. 08/237,484

The rejection of claims 1 through 9 under 35 U.S.C. § 103 as being unpatentable over Venkatesan in view of Bein is reversed.

The rejection of claims 1 through 9 under 35 U.S.C. § 103 as being unpatentable over Boszormenyi in view of Venkatesan is reversed.

The rejection of claims 10 through 18 under 35 U.S.C. § 103 as being unpatentable over Boszormenyi in view of Venkatesan is reversed.

The rejection of claim 10 under 35 U.S.C. § 102(e) as being anticipated by Bals is affirmed.

The decision of the examiner is affirmed-in-part.

Appeal No. 1996-3659
Application No. 08/237,484

No time period for taking any subsequent action in
connection with this appeal may be extended under
37 CFR § 1.136(a).

AFFIRMED-IN-PART

	Bradley R. Garris)	
	Administrative Patent Judge)	
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)	
	Charles F. Warren)	BOARD OF
PATENT)	
	Administrative Patent Judge)	APPEALS AND
)	INTERFERENCES
)	
)	
	Paul Lieberman)	
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tdc

Appeal No. 1996-3659
Application No. 08/237,484

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